

What is claimed is:

1. A frequency domain interpolative CODEC system for low bit rate coding of speech, comprising:
 - a linear prediction (LP) front end adapted to process an input signal providing LP parameters which are quantized and encoded over predetermined intervals and used to compute a LP residual signal;
 - an open loop pitch estimator adapted to process said LP residual signal, a pitch quantizer, and a pitch interpolator and provide a pitch contour within the predetermined intervals;
 - a voice activity detector adapted to process said LP parameters and said open loop pitch contour over said predetermined intervals; and
 - a signal processor responsive to said LP residual signal and the pitch contour and adapted to perform the following:
 - extract a prototype waveform (PW) from the LP residual and the open loop pitch contour for a number of equal sub-intervals within the predetermined intervals;
 - normalize the PW by a gain value of said PW;
 - encode a magnitude of said PW; and
 - provide a voicing measure, said voicing measure characterizing a degree of voicing of said input speech signal and is derived from several input parameters that are correlated to degrees of periodicity of the signal over the predetermined intervals, said voicing measure being provided for the purpose of:
 - regenerating a PW phase at a decoder; and
 - providing improved quantization of the PW magnitude at an encoder.
2. A system as recited in claim 1, wherein said predetermined interval comprises a frame.
3. A system as recited in claim 2, wherein said frame is preferably 20 ms.

4. A system as recited in claim 1, wherein said extraction of said PW sub-frame is preferably performed every 2.5 ms.
5. A system as recited in claim 1, wherein said voicing measure is encoded jointly with a PW nonstationarity measure using a spectrally weighted vector quantizer with a codebook partitioned based on a voiced/unvoiced mode.
6. A system as recited in claim 5, wherein said voicing measure is computed as the output of a nonlinear transformation having the following inputs
 - an open loop pitch gain;
 - a pitch variance;
 - a low frequency average of the PW nonstationarity measure;
 - a relative signal power; and
 - a PW correlation.